

REMARKS

In the Final Office Action¹ mailed on July 6, 2007, the Examiner rejected claims 1-60 under 35 U.S.C. § 101 as being directed to nonstatutory subject matter and rejected claims 55-58 under 35 U.S.C. § 103(a) as being unpatentable over Cellier et al., "Automated Formula Manipulation Supports Object-Oriented Continuous-System Modeling" ("Cellier") in view of Pantelides, C., "The Consistent Initialization of Differential-Algebraic Systems" ("Pantelides").

Applicant proposes to amend claims 1, 23-26, 34, 36, 40, 43-45, 49, 51-55, 58, and 59. Claims 1-60 remain pending.

Rejections under 35 U.S.C. § 101

The Examiner rejected claims 1-60 under 35 U.S.C. § 101 because the claims "preempt 'every substantial practical application' of an idea -- a mathematical algorithm." Office Action at 2. Applicant disagrees.

Claims 1-60 are directed to processing equations that model a system (i.e., an algorithm) and using the processed equations to simulate the system. Applicant's claims do not preempt every substantial practical application of an idea *because they are drawn only to simulation*. Simulation does not constitute every practical application of an idea. Simulation is only *one* practical application of Applicant's algorithm.

The Examiner cites Gottschalk v. Benson, 409 U.S. 63, 71, 72, 175 USPQ 673, 676 (1972), in support of the rejection. The issue decided in Benson, however, does not support the Examiner's contention that Applicant's claims preempt every substantial

¹ The Office Action contains a number of statements reflecting characterizations of the related art and the claims. Regardless of whether any such statement is identified herein, Applicant declines to automatically subscribe to any statement or characterization in the Office Action.

practical application of an idea. As noted by the Examiner at page 2 of the Office Action, the Benson court decided that a claim reciting a computer that solely calculates a mathematical formula or a computer disk that solely stores a mathematical formula is not patentable subject matter. see MPEP § 2106 (IV)(C)(3) (citing Benson, 409 U.S. 63, 71, 72, 175 USPQ 673, 676). Applicant's claims are not drawn to calculating a mathematical formula or storing a mathematical formula. Applicant's claims are drawn to simulation.

The Examiner further alleges that Applicant's claims are nonstatutory because they are not directed to a field of practical application "more specific" than simulation. Office Action at 2, 10, and 11. The Examiner, however, fails to show why simulation is not "specific" enough to be patentable subject matter. The U.S. Patent Office feels that simulation is "specific" enough to be statutory subject matter under 35 U.S.C. § 101 to provide an entire class (Class 703 Data Processing: Data Processing: Structural Design, Modeling, Simulation, and Emulation) to accommodate inventions drawn to this subject matter. Applicant notes that class 703, subclass 2, includes "Modeling by Mathematical Expression."

For at least the foregoing reasons, Applicant submits the Examiner's assertions that Applicant's claims preempt every substantial practical application of an idea and that simulation, as an application, is not sufficiently "specific" to be statutory subject matter 35 U.S.C. § 101 are incorrect.

The Examiner also rejected claims 1-60 under 35 U.S.C. § 101 as being directed to nonstatutory subject matter for lacking a "concrete, useful, and tangible" result. Office Action at 3. Although Applicant disagrees with the Examiner, Applicant proposes

to amend independent claims 1, 23, 43-45, 49, 53-55, 58, and 59 to move prosecution of this application forward.

As explained in the M.P.E.P., one test for determining whether a process is statutory is to determine whether it produces a “useful, concrete, and tangible result,” as required by State Street Bank & Trust Co. v. Signature Financial Group, Inc., 149 F.3d 1368, 1373 (Fed. Cir. 1998.). M.P.E.P. § 2106(IV)(c)(2).

In Ex Parte Bernard et al., 2007 WL 2183647, 1, 9 (Bd.Pat.App. & Interf.), the Board held statutory claims directed to the transformation of data via extraction and processing. Id. at 3. Specifically, the Board reasoned that the “transformation of intangible subject matter (i.e., data or signals) by a computer may qualify as a § 101 process,” and that “displaying information” is a useful, concrete, and tangible result. Id. at 3 and 4.

All of claims 1-60, as amended, recite “concrete, useful, and tangible” results. Like the claims held to be statutory in Ex Parte Bernard et al., independent claims 1, 23, 45, 49, 53, 54, and 58 are directed to the computer-based transformation of data and the display of information. Specifically, these claims are drawn to computer-implemented methods or computer-readable storage media containing computer-executable instructions for processing equations that model a system, simulating the system using the processed equations, and displaying results of the simulation. Similarly, the remaining independent claims 43, 44, and 55 are directed to computer-implemented methods or computer-readable storage media containing computer-executable instructions for processing equations that model a system, simulating the

system using the processed equations, and communicating results of the simulation to an external device.

Processing equations that model a system and using the processed equations to simulate the system constitute a “transformation of intangible subject matter (i.e., data or signals),” as contemplated by the Board in Ex Parte Bernard et al. Further, displaying results of the simulation and communicating results of the simulation to an external device are useful, concrete, and tangible results in accordance with the holding in Ex Parte Bernard et al. Displaying results of a simulation allows an engineer to determine if a particular system design will perform up to expectations or if changes to the design are required. Likewise, the communication of simulation results to an external device allows the simulation results to be stored and viewed by others. In addition, the U.S. Patent Office acknowledges that simulation, as an application, is useful. This is evidenced by the existence of class 703, which accommodates patents for inventions drawn to simulation, modeling, and emulation applications.

Further, the United States Court of Appeals, Federal Circuit recently noted in In re Comiskey, No. 2006-1286, 1, 12 (Fed. Cir. Sept. 20, 2007) that “the Supreme Court has held that a claim reciting an algorithm or abstract idea can be statutory subject matter only if, as employed in the process, it is embodied in, operates, transforms, or otherwise involves another class of statutory subject matter, i.e., a machine . . .” Id. at 8. Specifically, the Court noted such methods or algorithms can qualify as § 101 processes if they are “tied to an apparatus,” or “[invoke] a machine.” Id.

In addition to reciting statutory processes under § 101 directed to a *single* practical application (i.e., simulation) that produce “concrete, tangible, and useful”

results per M.P.E.P. § 2106(IV)(c)(2), State Street Bank, and Ex Parte Bernard for the reasons discussed above, Applicant's claims are also statutory under § 101 because they are "tied to an apparatus" and "[invoke] a machine," as discussed by the Court in In re Comiskey. For instance, independent claims 1, 43, 45, 53, 55, 58, and 59 recite *computer-implemented* methods of simulating a system and displaying or communicating results of the simulation. As such, these claims and their respective dependent claims recite methods or algorithms that are "tied to" and "invoke" a computer as per In re Comiskey.

Similarly, the remaining independent claims 23, 44, 49, and 54 and their respective dependent claims all recite *machine-readable storage media* storing *computer-executable* instructions for simulating a system. As such, these claims recite methods or algorithms that are "tied to" or "invoke" a computer. In addition, the methods or algorithms recited in these claims are "embodied in" statutory subject matter (i.e., machine-readable storage media) as per In re Comiskey.

For at least the foregoing reasons, Applicant submits that the simulation methods and algorithms recited in claims 1-60: (1) produce "useful, concrete, and tangible" results; (2) do not preempt every substantial practical application of an idea; and (3) are "tied to" and "invoke" a machine (i.e., a computer). Claims 1-60 are thus drawn to statutory subject matter under 35 U.S.C. § 101. Applicant respectfully requests the withdrawal of the rejections of claims 1-60 under 35 U.S.C. § 101.

Rejection under 35 U.S.C. § 103(a)

Applicant respectfully traverses the rejection of claim 55-58 under 35 U.S.C. § 103(a) as being unpatentable over Cellier in view of Pantelides. A *prima facie* case of obviousness has not been established with respect to claims 55-58.

To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. See M.P.E.P. § 2142, 8th Ed., Rev. 5 (August 2006). A *prima facie* case of obviousness has not been established with respect to claims 55-58 because, among other things, neither Cellier nor Pantelides, taken alone or in any reasonable combination, teach or suggest each and every element of claims 55-58.

The Examiner states on page 12 of the Office Action that Applicant's arguments with respect to claims 55-58 in the Reply filed on April 11, 2007 "were directed to limitations that do not appear in those claims." Office Action at 12. This is incorrect. At page 24 of the April 11, 2007 reply, Applicant noted that neither Cellier nor Pantelides, taken individually or in combination, disclose or suggest "eliminating an integral . . . wherein eliminating an integral includes assigning a preferred integration location rank to one or more integrals." This language was added to independent claim 55 in the Amendment After Final filed on October 10, 2006, which was entered by the Request for Continued Examination filed on November 16, 2006.

The Examiner agrees with Applicant that the cited prior art fails to disclose or suggest "eliminating an integral, wherein eliminating an integral includes assigning a preferred integration location rank to one or more integrals." Office Action at 11-12. In fact, for this reason the Examiner withdrew the rejection of claims 1-54 and 59-60 under

35 U.S.C. § 103(a). Office Action at 11. For at least this same reason the Examiner should also withdraw the rejection of claims 55-58 under 35 U.S.C. § 103(a).

Conclusion

Applicant respectfully requests entry of this Amendment under 37 C.F.R. § 1.116 which places claims 1-60 in a condition for allowance. Applicant submits that this reply does not raise new issues or necessitate the undertaking of any additional search of the art by the Examiner. Therefore, this Amendment should allow for immediate action by the Examiner.

In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our Deposit Account 06-0916.

Respectfully submitted,

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